

WHAT IS CLAIMED IS:

1 1. A routing device comprising:
2 a plurality of virtual routers;
3 a router manager configured to manage the plurality of virtual routers; and
4 an application, wherein the application is situated external to the plurality of
5 virtual routers;
6 wherein the application is able to selectively communicate with one or more of
7 the plurality of virtual routers on a dynamic basis to have the one or more virtual routers
8 perform a plurality of tasks.

1 2. The routing device of claim 1 wherein software is used to implement
2 the plurality of virtual routers and the router manager.

1 3. The routing device of claim 1 wherein each virtual router further
2 includes:
3 a routing protocol stack configured to handle a plurality of routing protocols;
4 a plurality of interface drivers configured to communicate with a plurality of
5 corresponding physical interfaces;
6 an Internet Protocol (IP) stack configured to interact with the routing protocol
7 stack and perform a forwarding function via the plurality of interface drivers, the IP stack
8 having a forwarding information table, information from which is used to perform the
9 forwarding function; and
10 a socket layer having a corresponding socket application programming
11 interface, the socket layer configured to facilitate interactions between the IP stack and the
12 routing protocol stack and the application, wherein the socket application programming
13 interface is used to facilitate communications with the socket layer.

1 4. The routing device of claim 3 further comprising:
2 an operating system kernel;
3 wherein the IP stack of each of the plurality of virtual routers resides external
4 to the operating system kernel.

1 5. The routing device of claim 4 wherein the operating system kernel
2 further includes an associated socket layer, the socket layer having a corresponding socket
3 application programming interface; and

4 wherein the application is able to communicate with the operating system
5 kernel via the associated socket layer using the corresponding socket application
6 programming interface to have the operating system kernel perform one or more of the
7 plurality of tasks.

1 6. An UNIX system incorporating the routing device as recited in claim
2 1.

1 7. A routing device comprising:
2 an operating system kernel;
3 a virtual router, wherein the virtual router resides external to the operating
4 system kernel;
5 a router manager configured to manage the virtual router;
6 an application residing external to the virtual router; and
7 a plurality of physical interfaces;
8 wherein the application is able to selectively interact with the virtual router
9 and the operating system kernel on a dynamic basis in order to have the virtual router and the
10 operating system kernel perform a plurality of tasks for the application.

1 8. The routing device of claim 7 wherein software is used to implement
2 the virtual router and the router manager.

1 9. The routing device of claim 7 wherein the virtual router further
2 includes:
3 a routing protocol stack configured to handle a plurality of routing protocols;
4 a plurality of interface drivers configured to communicate with corresponding
5 physical interfaces;
6 an Internet Protocol (IP) stack configured to interact with the routing protocol
7 stack and perform a forwarding function via the plurality of interface drivers, the IP stack
8 having a forwarding information table, information from which is used to perform the
9 forwarding function; and
10 a socket layer having a corresponding socket application programming
11 interface, the socket layer configured to facilitate interactions between the IP stack and the
12 routing protocol stack and the application, wherein the socket application programming
13 interface is used to facilitate communications with the socket layer.

1 10. The routing device of claim 9 wherein the IP stack of the virtual router
2 resides external to the operating system kernel.

1 11. The routing device of claim 7 wherein the operating system kernel
2 further includes an associated socket layer, the socket layer having a corresponding socket
3 application programming interface; and
4 wherein the application is able to communicate with the operating system
5 kernel via the associated socket layer using the corresponding socket application
6 programming interface to have the operating system kernel perform one or more of the
7 plurality of tasks.

1 12. An UNIX system incorporating the routing device as recited in claim
2 7.

1 13. A routing device comprising:
2 a plurality of virtual routers, each virtual router having an associated socket
3 layer and an Internet Protocol (IP) stack, the associated socket layer having a corresponding
4 socket application programming interface configured to facilitate communications with the
5 associated socket layer; and
6 an application residing external to the plurality of virtual routers;
7 wherein the associated socket layer is configured to facilitate interactions
8 between the IP stack and the application;
9 wherein the application is able to selectively interact with one of the plurality
10 of virtual routers via the associated socket layer; and
11 wherein the application uses the corresponding socket application
12 programming interface to interact with the associated socket layer.

1 14. The routing device of claim 13 further comprising:
2 an operating system kernel;
3 wherein the application is able to selectively interact with one or more of the
4 plurality of virtual routers and the operating system kernel on a dynamic basis in order to
5 have one or more of the plurality of virtual routers and the operating system kernel perform a
6 plurality of tasks for the application.

1 15. The routing device of claim 13 wherein the corresponding IP stacks of
2 the plurality of virtual routers reside external to the operating system kernel.

1 16. An UNIX system incorporating the routing device as recited in claim
2 13.